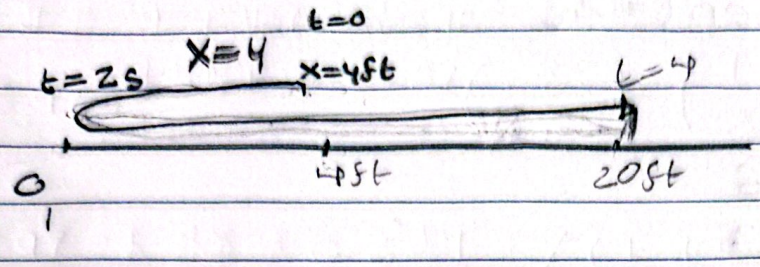


Q621005

$x = t^3 - 3t^2 + C$

$v = (3t^2 - 6t)$ ft/s t en seg

$a = 6t - 6$

$x = 4$ en $t = 0$

a) el tiempo cuando la particula pasa por el origen

$\dot{x} = t^3 - 6t^2 + C$

$X(t) = t^3 - 6t^2 + C$

$X(0) = (0)^3 - 6(0) + C = 4$

$C = 4$

$X(t) = t^3 - 3t^2 + 4$

$0 = t^3 - 3t^2 + 4$

$t^3 + t^2 - 4t^2 + 4 = 0$

$t^2(t+1) + 4(-t^2 + 1) = 0$

$t^2(t+1) + 4(1^2 - t^2) = 0$

$t^2(t+1) + 4((1-t)(1+t)) = 0$

$(t+1)(t^2 + 4(1-t)) = 0$

$(t+1)(t^2 + 4 - 4t) = 0$

$(t+1)(t^2 - 4t + 4) = 0$

$(t+1)(t-2)^2 = 0$

$t = -1 \qquad (t-2)^2 = 0$

$t = 2$ s

b) aceleracion en $t = 2s$

$a(t) = 6t - 6$

$a(2) = 6(2) - 6$

$a(2) = 6\ ft/s^2$

c) La velocida cuando P pasa por O

o sea en $t = 2$

$V(t) = 3t^2 - 6t$

$V(2) = 3(2)^2 - 6(2)$

$V(2) = 12 - 12 =, \quad V = 0\ m/s$

d) el desplazamiento para $t = 4s$

$d = D = X(4) - X(0) \quad , \quad X(0) = 4\ ft$

$X(4) = (4)^3 - 3(4)^2 + 4$

$X(4) = 20\ ft$

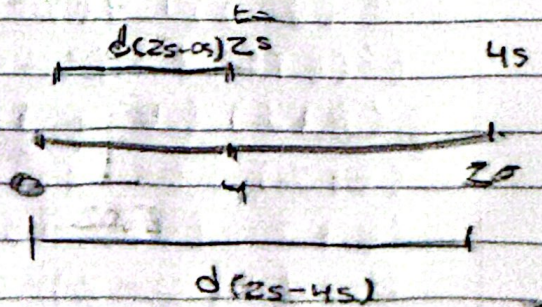
$D = (20 - 4)\ ft, \quad D = 16\ ft$

c) distancia total recorrida despues de 4s

$DTR = X(0) + X(4)$

$DTR = (4 + 20)\ ft$

$DTR = 24\ ft$



f) Velocidad Promedio en $t = 4\,s$

$$V_{prom} = \frac{\Delta x}{\Delta t} = \frac{x(4) - x(0)}{4 - 0}$$

$$V_{prom} = \frac{20 - 4}{4} = \frac{16}{4} = \underline{4\,ft/s}$$

g) Rapidez promedio

$$R_{prom} = \frac{\Delta d}{\Delta t} = \frac{(24 - 0)\,ft}{(4 - 0)\,s} = \underline{6\,ft/s}$$